UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,526	01/30/2002	Alfred Kwok-Kit Wong	01-819 1496.00190	8413

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LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106 LEGAL
MILPITAS, CA 95035

EXAMINER
CHASE, SHELLY A

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/060,526	WONG ET AL.
	Examiner	Art Unit	
	Shelly A Chase	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 January 2002_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-19_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-3, 6-7, 11-12, 16-17 & 19_ is/are rejected.

7)☐ Claim(s) _4-5, 8-10, 13-15 & 18_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _1-13-2002_.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1 to 19 are presented for examination.

Information Disclosure Statement

2.   The reference listed in the information disclosure statement submitted on 1-30-2002 has been considered by examiner (see attached PTO-1449).

Drawings

3.   Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5.   Claims **1** to **2, 6** to **7** and **19** are rejected under 35 U.S.C. 102(b) as being anticipated by Itakura et al. (USP 5418795).

Claims **1** and **19**:

Itakura teaches a Viterbi decoder (see fig. 1) comprising: a branch metric calculation circuit [3] computing a plurality of branch metrics [BMX1, BMX2, BMX3, BMX4 (see col. 7, lines 3 to 7) and an add-compare-select-state metric normalization circuit (ACS-SM) [4] receiving the computed branch metrics (see fig. 1 and col. 7, lines 8 to 12). Itakura also teaches that the ACS-SM circuit accumulates the received branch metrics and stored state metrics to obtain a sum ("intermediate signal") (see col. 7, lines 9 to 18 and col. 8, lines 1 et seq.)

Itakura further teaches that the ACS-SM determines the maximum likelihood by comparing the sum of the plurality of computed sum and selecting the result that has the maximum likelihood (see col. 7, lines 19 to 25 and col. 8, lines 17 to 28), which read on "determine a next state metric signal to said state metric signals." Itakura teaches that the normalization command circuit [5] determines the normalization of the computed state metric and issues a normalized command to normalize the sum (see col. 7, lines 25 et seq.).

As per claim **2**, Itakura teaches an ACS-SM normalization circuit receiving the branch metrics and the normalization command, producing a sum and a normalized metric based on the received command (see col. 7, lines 20 to 36); interpreted as "wherein determining said next state metric signal and determining said normalization signal are performed in parallel."

As per claims **6** and **7**, Itakura teaches that the branch metric circuit receives processed input ("fixed point variable") from a punctured circuit and the ACS-Sm performs to prevent state metric overflow (see col. 4, lines 25 to 30 and col. 10, lines 16 to 30).

6.   Claims **11** to **12** and **16** to **17** are rejected under 35 U.S.C. 102(e) as being anticipated by Ulmer et al. (USP 6189126 B1).

Claim **11**:

Ulmer discloses an a posteriori probability decoder (APP) (see col. 3, lines 12 to 15), comprising: a plurality of state metric calculation units [30, 32 & 34] adding a

plurality of received branch metrics to generate a plurality of state metrics (see col. 5, lines 30 to 40), which reads on "adding a plurality of branch metric signals to a plurality of state metric signals to generate a plurality of intermediate signals." Ulmer also teaches the state metric units update the state metric based on the computed previously state metric (see col. 6, lines 5 to 15), which reads on " determining a next state metric signal to said state metric signals in response to said intermediate signal."

Ulmer further teaches a minimum calculation unit computes the minimum of the most significant bit and the computed minimum is used as the normalization-metric (NM) (see col. 6, lines 20 to 25); which reads on "determining a normalization signal in response to said intermediate signals." Ulmer teaches that the combiner receives the (NM) to normalized the state metric (see 6, lines 42 et seq.).

As per claim **12**, Ulmer teaches computing the minimum is performed concurrently with computing new state metric (see col. 3, lines 48 to 52); interpreted as " wherein said steps of determining said next state metric signal and determining said normalization signal are performed in parallel."

As per claims **16** and **17**, the received code according to a generator matrix is processed and input to the decoder (see col. 5, lines 1 to 5) and the decoder is normalized to ensure that data is not loss (see col. 15 to 22), interpreted as " fixed point variables" and "to prevent overflow."

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claim **3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et

al. in view of Gross et al. (*Simplified MAP algorithm suitable for implementation of turbo*

decoders, IEEE).

As per claim **3**, Itakura does not specifically teach determining said next state

metric signal is a maximum operation of said intermediate signals with a correction

factor; however, Gross in an analogous art teaches a maximum a posteriori (MAP)

algorithm that utilizes a MAX* operation with a correction factor (see pg. 1577 to 1578).

Therefore, it would have been obvious to one having ordinary skill in the art at the time

the invention was made to modify the Viterbi decoding method of Itakura to include a

MAP decoding algorithm utilizing a MAX* operation and a correction factor as taught by

Gross. This modification would have been obvious because a person of ordinary skill in

the art would have been motivated to employ a decoding method that will reduce the

decoding complexity and increase decoding speed when a MAX* operation with a

correction factor is applied.

Allowable Subject Matter

9.   Claims 4 to 5, 8 to 10, 13 to 15 and 18 are objected to as being dependent upon

a rejected base claim, but would be allowable if rewritten in independent form including

all of the limitations of the base claim and any intervening claims.

Conclusion

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Shelly A Chase whose telephone number is 703-308-

7246. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on 703-305-9595. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Shelly A Chase